

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Matthew R. Selmon, et al.)
Serial No.: Not Yet Assigned) Group No.: Not Yet Assigned
Filed: Herewith) Examiner: Not Yet Assigned
For: **Methods and Apparatus For Treating**)
Vascular Occlusions)
which is a Continuation of:)
Serial No.: 09/149,874)
Filed: September 8, 1998)

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to examination and calculation of the filing fee of the above-identified patent application on the merits, please enter the following amendments.

IN THE SPECIFICATION

On the cover page, please add -- Gerald Hansen-- and --E. Richard Hill III-- to the list of inventors.

On page 2, lines 3-4, please replace "The following patent application is a continuation-in-part application of Serial No. 08/775,264 filed February 28, 1997." with --This patent application is a continuation of U.S. patent application serial no. 09/149,874, filed September 8, 1998, which is a continuation-in-part of U.S. patent application serial no. 08/775,264 filed February 28, 1997.--

a continuation of U.S. patent application serial no. 09/149,874, filed September 8, 1998, which is a continuation-in-part of U.S. patent application serial no. 08/775,264 filed February 28, 1997.--

IN THE CLAIMS

Please cancel claims 1-56 without prejudice.

Please add the following claims.

1 57. (New) A catheter for treating a vascular occlusion, comprising:
2 an elongated shaft including a proximal section and a distal section, and at least one lumen
3 extending from the proximal section to the distal section;
4 two spreading members at the distal section of the elongated shaft, wherein each of the
5 spreading members comprises a free distal end that moves laterally away from a longitudinal axis of
6 the elongated shaft to disrupt an occlusion in peripheral vasculature; and
7 an actuating assembly positioned along the elongated shaft to move the free distal ends of the
8 two spreading members laterally in response to an actuation force.

1 58. (New) The catheter as recited in claim 57, wherein each of the two spreading
2 members includes a cam follower on an interior of the spreading member.

1 59. (New) The catheter as recited in claim 58, wherein the actuating assembly includes
2 an actuation element including a distal end with a cam, wherein the cam is in contact with the cam
3 follower to urge the spreading member in a substantially lateral direction.

1 60. (New) The catheter as recited in claim 59, wherein the cam is configured as a central
2 hub, and wherein the spreading member is urged in a substantially lateral direction when the cam is
3 moved in a relatively proximal direction.

1 61. (New) The catheter as recited in claim 59, wherein the cam is formed with an edge
2 that slidably contacts the cam follower, and wherein the spreading member is urged in a substantially
3 lateral direction when the cam is moved in a relatively distal direction.

1 62. (New) The catheter as recited in claim 59, wherein the distal section of the elongated
2 shaft is formed with a co-linear bearing surface.

1 63. (New) The catheter as recited in claim 62, wherein the cam is configured for slidable
2 movement along the co-linear bearing surface and the cam follower.

1 64. (New) The catheter as recited in claim 57, wherein the distal section of the elongated
2 shaft comprises a hub about the elongated shaft.

1 65. (New) The catheter as recited in claim 64, further comprising a collar section fitted
2 about the hub.

1 66. (New) The catheter as recited in claim 65, wherein the two spreading members and
2 the collar section are parts of a unitary body.

1 67. (New) The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially curved end.

1 68. (New) The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially tapered end.

1 69. (New) The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially pointed end.

1 70. (New) An intravascular tissue expanding catheter, comprising:

2 a catheter shaft formed of braided material, wherein the catheter shaft comprises at least one

3 conduit extending along a longitudinal axis of the catheter shaft;

4 a housing formed at a distal end of the catheter shaft, wherein the housing includes two

5 deflecting members that each comprise a free distal tip that moves in a lateral direction away from

6 the longitudinal axis of the catheter shaft to expand tissue of peripheral vasculature; and

7 an actuation assembly that moves the distal tips of the two deflecting members away from the
8 longitudinal axis of the catheter shaft.

9 71. (New) A catheter as in claim 70, wherein the two deflecting members each include an
10 integrally formed hinge about which the distal tip of the deflecting member rotates.

11 72. (New) A catheter as in claim 70, wherein the two deflecting members are each
12 coupled to a discrete hinge about which the distal tip of the deflecting member rotates.

13 73. (New) A catheter as in claim 70, each of the two deflecting members includes an
14 internal cam follower.

15 74. (New) A catheter as in claim 73, wherein the actuation assembly includes a cam
16 positioned within the housing for slidable movement along the cam followers of the two deflecting
17 members to move the distal tips of the two deflecting members in a lateral direction.

18 75. (New) A catheter as in claim 74, wherein the at least one conduit includes an
19 actuation conduit, and wherein the catheter further comprises a push tube positioned relatively
20 proximal to the cam follower within the actuation conduit.

1 76. (New) A catheter as in claim 74, wherein the at least one conduit includes an
2 actuation conduit, and wherein the catheter further comprises a rotational tube positioned relatively
3 proximal to the cam follower within the actuation conduit.

1 77. (New) A catheter as in claim 74, wherein the at least one conduit includes an
2 actuation conduit, and wherein the catheter further comprises a pulling element positioned relatively
3 proximal to the cam follower within the actuation conduit.

1 78. (New) A catheter as in claim 70, wherein the actuation assembly includes at least one
2 pulling element connected to the two deflecting members.

1 79. (New) A catheter as in claim 78, wherein each of the two deflecting members is
2 connected to the housing with a hinge pin to form a hinge about which the distal tip rotates when the
3 pulling element is pulled in a relatively proximal direction.

1 80. (New) A catheter as in claim 78, wherein each of the two deflecting members and the
2 housing are integrally formed of nitinol with a flexible hinge section about which the distal tip
3 rotates when the pulling element is pulled in a relatively proximal direction.

1 81. (New) A catheter as in claim 78, wherein the pulling element is formed of nitinol.

1 82. (New) A catheter as in claim 70, wherein the catheter shaft defines a guidewire
2 conduit.

1 83. (New) A catheter as in claim 82, wherein the guidewire conduit is offset from the
2 longitudinal axis of the shaft.

1 84. (New) A catheter for use in peripheral vasculature, comprising:
2 a catheter body comprising at least one conduit extending through the catheter body;
3 two tissue expanding members coupled to a distal section of the catheter body, wherein each
4 of the two tissue expanding members includes a proximal portion and a distal portion, and wherein
5 the distal portion is free to move away from a longitudinal axis of the catheter body relative to the
6 proximal portion; and
7 an actuation assembly within the catheter body such that when the actuation assembly
8 contacts the two tissue expanding members, the distal portions of the expanding members move
9 away from the longitudinal axis.

1 85. (New) A catheter as in claim 84, wherein the distal section of the catheter body
2 includes a fixed extension, and wherein the proximal portions of the two tissue expanding members
3 are coupled to the fixed extension with a hinge pin.

1 86. (New) A catheter as in claim 85, wherein the actuation assembly includes at least one
2 actuation wire coupled to the proximal portions of the two tissue expanding members, such that the
3 distal portions of the two tissue expanding members move away from the longitudinal axis when the
4 actuation wire is pulled in a proximal direction.

1 87. (New) A catheter as in claim 86, wherein the distal section of the catheter body
2 includes a guidewire lumen.

1 88. (New) A catheter as in claim 87, wherein the hinge pin is positioned between the
2 guidewire lumen and the actuation wire within the distal section of the catheter body.

1 89. (New) A catheter as in claim 87, wherein the guidewire lumen is positioned between
2 the hinge pin and the actuation wire within the distal section of the catheter body.

1 90. (New) A catheter as in claim 89, further comprising a guidewire tube extension with
2 an outer surface positioned along at least a portion of the fixed extension for enclosing a guidewire.

1 91. (New) A catheter as in claim 90, wherein the two tissue expanding members each
2 include a surface that is complementary to the outer surface of the guidewire tube extension.

CONCLUSION

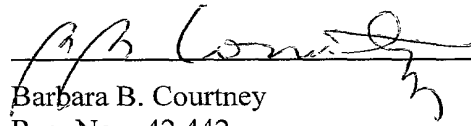
Applicants submit this Preliminary Amendment prior to the examination of this application on the merits. Applicants respectfully request the entry of the foregoing amendments prior to examination of the present application.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 17965-798).

Respectfully submitted,

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Date: 04-13-01


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"Clean" sheet for the added "New" claims
Continuation Patent Application of 09/149,874

Please add the following claims.

57. A catheter for treating a vascular occlusion, comprising:
an elongated shaft including a proximal section and a distal section, and at least one lumen
extending from the proximal section to the distal section;
two spreading members at the distal section of the elongated shaft, wherein each of the
spreading members comprises a free distal end that moves laterally away from a longitudinal axis of
the elongated shaft to disrupt an occlusion in peripheral vasculature; and
an actuating assembly positioned along the elongated shaft to move the free distal ends of the
two spreading members laterally in response to an actuation force.

58. The catheter as recited in claim 57, wherein each of the two spreading members
includes a cam follower on an interior of the spreading member.

59. The catheter as recited in claim 58, wherein the actuating assembly includes an
actuation element including a distal end with a cam, wherein the cam is in contact with the cam
follower to urge the spreading member in a substantially lateral direction.

1 60. The catheter as recited in claim 59, wherein the cam is configured as a central hub,
2 and wherein the spreading member is urged in a substantially lateral direction when the cam is
3 moved in a relatively proximal direction.

1 61. The catheter as recited in claim 59, wherein the cam is formed with an edge that
2 slidably contacts the cam follower, and wherein the spreading member is urged in a substantially
3 lateral direction when the cam is moved in a relatively distal direction.

1 62. The catheter as recited in claim 59, wherein the distal section of the elongated shaft is
2 formed with a co-linear bearing surface.

1 63. The catheter as recited in claim 62, wherein the cam is configured for slidable
2 movement along the co-linear bearing surface and the cam follower.

1 64. The catheter as recited in claim 57, wherein the distal section of the elongated shaft
2 comprises a hub about the elongated shaft.

1 65. The catheter as recited in claim 64, further comprising a collar section fitted about the
2 hub.

1 66. The catheter as recited in claim 65, wherein the two spreading members and the collar
2 section are parts of a unitary body.

1 67. The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially curved end.

1 68. The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially tapered end.

1 69. The catheter as recited in claim 57, wherein the spreading member includes a
2 substantially pointed end.

1 70. An intravascular tissue expanding catheter, comprising:
2 a catheter shaft formed of braided material, wherein the catheter shaft comprises at least one
3 conduit extending along a longitudinal axis of the catheter shaft;
4 a housing formed at a distal end of the catheter shaft, wherein the housing includes two
5 deflecting members that each comprise a free distal tip that moves in a lateral direction away from
6 the longitudinal axis of the catheter shaft to expand tissue of peripheral vasculature; and
7 an actuation assembly that moves the distal tips of the two deflecting members away from the
8 longitudinal axis of the catheter shaft.

1 71. A catheter as in claim 70, wherein the two deflecting members each include an
2 integrally formed hinge about which the distal tip of the deflecting member rotates.

1 72. A catheter as in claim 70, wherein the two deflecting members are each coupled to a
2 discrete hinge about which the distal tip of the deflecting member rotates.

1 73. A catheter as in claim 70, each of the two deflecting members includes an internal
2 cam follower.

1 74. A catheter as in claim 73, wherein the actuation assembly includes a cam positioned
2 within the housing for slidable movement along the cam followers of the two deflecting members to
3 move the distal tips of the two deflecting members in a lateral direction.

1 75. A catheter as in claim 74, wherein the at least one conduit includes an actuation
2 conduit, and wherein the catheter further comprises a push tube positioned relatively proximal to the
3 cam follower within the actuation conduit.

1 76. A catheter as in claim 74, wherein the at least one conduit includes an actuation
2 conduit, and wherein the catheter further comprises a rotational tube positioned relatively proximal
3 to the cam follower within the actuation conduit.

1 77. A catheter as in claim 74, wherein the at least one conduit includes an actuation
2 conduit, and wherein the catheter further comprises a pulling element positioned relatively proximal
3 to the cam follower within the actuation conduit.

1 78. A catheter as in claim 70, wherein the actuation assembly includes at least one pulling
2 element connected to the two deflecting members.

1 79. A catheter as in claim 78, wherein each of the two deflecting members is connected to
2 the housing with a hinge pin to form a hinge about which the distal tip rotates when the pulling
3 element is pulled in a relatively proximal direction.

1 80. A catheter as in claim 78, wherein each of the two deflecting members and the
2 housing are integrally formed of nitinol with a flexible hinge section about which the distal tip
3 rotates when the pulling element is pulled in a relatively proximal direction.

1 81. A catheter as in claim 78, wherein the pulling element is formed of nitinol.

1 82. A catheter as in claim 70, wherein the catheter shaft defines a guidewire conduit.

1 83. A catheter as in claim 82, wherein the guidewire conduit is offset from the
2 longitudinal axis of the shaft.

1 84. A catheter for use in peripheral vasculature, comprising:
2 a catheter body comprising at least one conduit extending through the catheter body;
3 two tissue expanding members coupled to a distal section of the catheter body, wherein each
4 of the two tissue expanding members includes a proximal portion and a distal portion, and wherein
5 the distal portion is free to move away from a longitudinal axis of the catheter body relative to the
6 proximal portion; and
7 an actuation assembly within the catheter body such that when the actuation assembly
8 contacts the two tissue expanding members, the distal portions of the expanding members move
9 away from the longitudinal axis.

1 85. A catheter as in claim 84, wherein the distal section of the catheter body includes a
2 fixed extension, and wherein the proximal portions of the two tissue expanding members are coupled
3 to the fixed extension with a hinge pin.

1 86. A catheter as in claim 85, wherein the actuation assembly includes at least one
2 actuation wire coupled to the proximal portions of the two tissue expanding members, such that the
3 distal portions of the two tissue expanding members move away from the longitudinal axis when the
4 actuation wire is pulled in a proximal direction.

1 87. A catheter as in claim 86, wherein the distal section of the catheter body includes a
2 guidewire lumen.

1 88. A catheter as in claim 87, wherein the hinge pin is positioned between the guidewire
2 lumen and the actuation wire within the distal section of the catheter body.

1 89. A catheter as in claim 87, wherein the guidewire lumen is positioned between the
2 hinge pin and the actuation wire within the distal section of the catheter body.

1 90. A catheter as in claim 89, further comprising a guidewire tube extension with an outer
2 surface positioned along at least a portion of the fixed extension for enclosing a guidewire.

1 91. A catheter as in claim 90, wherein the two tissue expanding members each include a
2 surface that is complementary to the outer surface of the guidewire tube extension.